

CLAIMS

1. A heat transport device comprising:

a first base plate including a liquid suction and  
5 retention unit for sucking and retaining a liquid-phase  
working fluid by capillary force;  
a second base plate facing the first base plate,  
including a face provided with a first concavity functioning  
as a vaporization chamber for vaporizing the liquid-phase  
10 working fluid retained in the liquid suction and retention  
unit to a gas-phase working fluid, a second concavity  
functioning as a liquefaction chamber for liquefying the  
gas-phase working fluid vaporized at the vaporization  
chamber to the liquid-phase working fluid, a first ditch  
15 functioning as a channel for transporting the gas-phase  
working fluid from the vaporization chamber to the  
liquefaction chamber, and a second ditch functioning as a  
channel for transporting the liquid-phase working fluid from  
the liquefaction chamber to the liquid suction and retention  
20 unit, the second base plate comprising a material having a  
thermal conductivity lower than that of silicon; and  
a thermoplastic or thermosetting resin material for  
bonding the first and second base plates.

25 2. The heat transport device according to claim 1,

further comprising a third base plate facing the second base plate, so that the third base plate is disposed remote from the first base plate.

5       3. The heat transport device according to claim 2, wherein the first base plate and the third base plate envelop the second base plate, and the periphery of the first base plate and the periphery of the third base plate are sealed.

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4. The heat transport device according to claim 1, further comprising a pair of laminating sheets disposed on the top face of the first base plate and on the bottom face of the second base plate so as to envelop the first and the second base plates.

15       5. The heat transport device according to claim 4, wherein the laminating sheets comprise a metal foil.

20       6. The heat transport device according to claim 2, wherein the second base plate comprises a resin material and the third base plate comprises a metal material.

25       7. The heat transport device according to claim 6, wherein the difference in coefficient of linear expansion

between the second base plate and the third base plate is 5  
 $\times 10^{-6}$  (1/°C) or less.

8. The heat transport device according to claim 1,  
5 further comprising a fourth base plate facing the third base  
plate, so that the fourth base plate is disposed remote from  
the first base plate.

9. A heat transport device comprising:  
10 a vaporization unit including;  
a first base plate having a liquid suction and  
retention unit for sucking and retaining a liquid-phase  
working fluid by capillary force;  
a second base plate facing the first base plate,  
15 having a face provided with a concavity functioning as a  
vaporization chamber for vaporizing the liquid-phase working  
fluid retained in the liquid suction and retention unit to a  
gas-phase working fluid, and comprising a material having a  
thermal conductivity lower than that of silicon; and  
20 a thermoplastic or thermosetting resin material for  
bonding the first and second base plates;  
a liquefaction unit including;  
a third base plate;  
a fourth base plate facing the third base plate,  
25 having a face provided with a concavity functioning as a

liquefaction chamber for liquefying the gas-phase working fluid to the liquid-phase working fluid, and comprising a material having a thermal conductivity lower than that of silicon; and

5 a thermoplastic or thermosetting resin material for bonding the third and fourth base plates;

a channel for transporting the gas-phase working fluid from the vaporization unit to the liquefaction unit; and

10 a channel for transporting the liquid-phase working fluid from the liquefaction unit to the vaporization unit.

10. A method for manufacturing a heat transport device, comprising:

15 a step of forming a first base plate including a liquid suction and retention unit for sucking and retaining a liquid-phase working fluid by capillary force;

20 a step of forming a second base having a face provided with a first concavity functioning as a vaporization chamber for vaporizing the liquid-phase working fluid retained in the liquid suction and retention unit to a gas-phase working fluid, a second concavity functioning as a liquefaction chamber for liquefying the gas-phase working fluid vaporized at the vaporization chamber to the liquid-phase working fluid, a first ditch functioning as a channel for 25 transporting the gas-phase working fluid from the

vaporization chamber to the liquefaction chamber, and a second ditch functioning as a channel for transporting the liquid-phase working fluid from the liquefaction chamber to the liquid suction and retention unit;

5 a step of laminating the first base plate, a thermoplastic or thermosetting resin material, and the second base plate; and

a step of bonding the first and the second base plates with the thermoplastic or thermosetting resin material by

10 heating the composite of the first base plate, the thermoplastic or thermosetting resin material, and the second base plate under a pressurized condition.